Section 3.8

**Activity 3.8.1**

One reason why the future net cash flow forecasts of each of the following projects might be uncertain:

a. Future sales of the new cars.

b. The forecasted cost savings from the new system.

c. The accuracy of the market research.

d. How many car drivers will use the toll road.

e. How much the power station will cost to build.

**Activity 3.8.2**

1. ‘Investment appraisal’ is evaluating the profitability or desirability of an investment project.
2. The payback periods for Project X and Project Y:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** |  | **Project X** | **Cumulative cash flow** | **Project Y** | **Cumulative cash flow** |
|  | 0 | ($50 000) | ($50 000) | ($80 000) | ($80 000) |
|  | 1 | $25 000 | ($25 000) | $45 000 | ($35 000) |
|  | 2 | $20 000 | ($5 000) | $35 000 | 0 |
|  | 3 | $20 000 | $15 000 | $17 000 | $17 000 |
|  | 4 | $15 000 | $30 000 | $15 000 | $32 000 |
|  | 5 | $10 000 | $40 000 | – | – |

* Project X – ($5,000 / $20,000) x 12 = 3 months and 2 years
* Project Y – 2 years.

1. ARR for project X and Y

* Project X: ($25 000 + $20 000 + $20 000 + $15 000 + $10 000 - $50,000) / 5 = $8,000

$8,000 / 50,000 x 100 = 16%.

* Project Y: ($45 000 + $35 000 + $17 000 + $15 000 – 80,000) / 4 = $8,000

$8,000 / $80,000 x 100 = 10%.

1. The financial factors that might affect Ashton Textiles’ choice of project could be:

* Project Y pays back more quickly than X
* Project X has a higher ARR than project Y
* Project X has a lower initial investment than project Y.

The non-financial factors might be:

* Ashton’s good relationship with the supplier of machine Y
* Machine X’s mixed reviews on reliability
* Machine X is imported and affected by the exchange rate
* Project Y is supplied by a local firm.

**Activity 3.8.3**

1. ‘Net present value’ is the use of discounted cash flows to assess an investment project.
2. Net present value of the new gym:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** |  | **Net cash flows ($)** | **Discount factor @ 14%** | **Present value** |
|  | 0 | (850 000) | 1 | (850,000) |
|  | 1 | 240 000 | 0.88 | 211,200 |
|  | 2 | 300 000 | 0.76 | 228,000 |
|  | 3 | 350 000 | 0.67 | 234,500 |
|  | 4 | 350 000 | 0.59 | 206,500 |
|  |  |  | NPV | 30,200 |

1. If the discount interest rate increased, the net present value would fall as the cash flows are discounted at a higher rate.
2. On the basis of financial factors, the decision to open the new gym would be affected by:

* ARR of above 10% is acceptable
* Payback of 3 years is acceptable
* NPV is positive.

The non-financial factors might be:

* High profile city location
* Threat of a rise in interest rates
* Strongly growing market.

**Activity 3.8.4**

1. ‘Payback’ is the time it takes for the initial investment of a project to be repaid.
2. Payback and ARR for location A and B:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Location A** | **Cumulative cash flow** | **Location B** | **Cumulative cash flow** |
| 0 | ($12 000) | ($12 000) | ($12 000) | ($12 000) |
| 1 | $3000 | ($9000) | $6000 | ($6000) |
| 2 | $4000 | ($5000) | $5000 | ($1000) |
| 3 | $5000 | 0 | $3000 | $2000 |
| 4 | $6000 | $6000 | $2000 | $4000 |
| 5 | $5000 | $11 000 | $5000 | $9000 |

* Payback location A – 3 years
* Payback location B – ($1,000 / $3,000) x 12 = 4 months and 2 years
* ARR location A – ($3000 + $4000 + $5000 + $6000 + $5000 - $12,000) / 5 = $2,200/12,000 x 100 = 18.3%
* ARR location B – ($6000 + $5000 + $3000 + $2000 + $5000 - $12,000) / 5 = $1,800/12,000 x 100 = 15%.

1. On the basis of the ARR location A is more favourable and location B has the more favourable payback.
2. The NPV of location A and location B:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Location A** | **DF 10%** | **Present value** | **Location B** | **DF 10%** | **Present value** |
| 0 | ($12 000) | 1 | ($12,000) | ($12 000) | 1 | ($12 000) |
| 1 | $3000 | 0.91 | $2730 | $6000 | 0.91 | $5460 |
| 2 | $4000 | 0.83 | $3320 | $5000 | 0.83 | $4150 |
| 3 | $5000 | 0.75 | $3750 | $3000 | 0.75 | $2250 |
| 4 | $6000 | 0.68 | $4080 | $2000 | 0.68 | $1360 |
| 5 | $5000 | 0.62 | $3100 | $5000 | 0.62 | $3100 |
|  |  | NPV | $4980 |  | NPV | $4320 |

1. Location A should be chosen because it has the highest NPV.
2. Problems of using the NPV method of deciding between different investment projects might include:

* Interest rates change
* Inaccurate forecasts of net cash flows
* Inaccurate forecast of the length of the project.

**Exam practice questions**

1. Two difficulties Asia Print might have forecasting future sales include:

* The selling price of its product might change
* The units sold might be different to the forecast.

1. The payback of the ARR and payback period of project Y and Z:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Project Y $m** | **Cumulative cash flow** | **Project Z $m** | **Cumulative cash flow** |
| 0 | (20) | (20) | (12) | (12) |
| 1 | ($1.25 - $0.5) x 8  - 1 = 5 | (15) | ($1.25 - $0.5) x 6  - 0.5 = 4 | (8) |
| 2 | ($1.25 - $0.5) x 8  - 1 = 5 | (10) | ($1.25 - $0.5) x 6  - 0.5 = 4 | (4) |
| 3 | ($1.25 - $0.5) x 8  - 1 = 5 | (5) | ($1.25 - $0.5) x 6  - 0.5 = 4 | 0 |
| 4 | ($1.25 - $0.5) x 8  - 1 = 5 | 0 | ($1.25 - $0.5) x 6  - 0.5 + 0.5 = 4.5 | 4.5 |
| 5 | ($1.25 - $0.5) x 8  - 1 + 1 = 6 | 4 |  |  |

* Project Y: four-year payback
* Project Z: three-year payback
* Project Y: ARR (5 + 5 + 5 + 5 + 6 - 20 / 5) / 20 = 6%
* Project Z: ARR (4 + 4 + 4 + 4.5 – 12 / 4) /12 = 9.4%

1. On the basis of financial factors:

* Project Z has a shorter payback period than project Y
* Project Z has a higher ARR than project Y.

On the basis of non-financial factors:

* Project Y: automatic, internet links, six redundancies, needs highly trained operatives
* Project Z: semi-automatic, limited facilities, reliable, three redundancies, complaints from local residents.

**Key concept question**

Investment appraisal plays the following role in business strategy and innovation:

* Guides future decisions on significant investment and innovation
* Provides analysis of future cash inflows and outflows of an investment and innovation decision
* Gives an assessment of the financial strengths and weaknesses of an investment and innovation decision
* Allows organisations to make an assessment of risk associated with strategy and innovation
* Can be used in conjunction with non-monetary factors associated with innovation and strategy.

Its weaknesses are:

* Market conditions change over time
* Inaccurate forecasted future cash inflows and outflows
* Difficult to balance the importance of monetary and non-monetary factors.